

# **Ground Water Classifications and Designated Uses Workgroup**

New Jersey Department of Environmental Protection (NJDEP)  
Division of Water Monitoring and Standards (DWMS)  
Bureau of Environmental Analysis, Restoration and Standards (BEARS)

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# I. Welcome & Introductions

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Ground Water Quality Standards (GWQS) Team

NJDEP DWMS BEARS

# Recap of Key Issues

- Consider changes to Class I, II and III designations
- Refine or revise Class II and Class III designated uses, criteria and implementation
- Correct/update Classification Area boundaries and replace codified maps with digitized GIS Coverages

# II. Review and Discussion of Key Issues

Deborah Kratzer, Workgroup Leader  
NJDEP DWMS BEARS GWQS Team

# Updating Ground Water Classification System Mapping

- Overview of current Ground Water Classification System
- Updates to Classification System maps and replacement with digitized mapping tools
- Possible rule changes

# Water Pollution Control Act

## N.J.S.A 58:10A-1

- “It is the policy of this State to restore, enhance and maintain the chemical, physical, and biological integrity of its waters, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water.”

# Current Ground Water Classifications and Designated Uses

From N.J.A.C. 7:9C-1.5(a)

“(a) Ground water is classified according to the **hydrogeologic characteristics** of the ground water resource and the **designated use(s)** which are to be maintained, restored and enhanced within the classification area. Classifications are **regional in nature** and do not reflect localized infringements on designated uses due to natural quality or pollution incidents.....”



# Overview: Current Ground Water Classifications and Designated Uses

Ground Water Classification	Primary Designated Use
Class I	Ground Water of Special Ecological Significance
Class II	Ground Water for Potable Water Supply
Class III	Ground Water for Uses Other Than Potable Water Supply



# Site-specific confirmation of ground water classification & applicable criteria

From N.J.A.C. 7:9C-1.5(f)<sup>4</sup>

“...areas are **subject to field verification wherever necessary...** The precise borders of ... areas shall be **confirmed using site specific data** in the context of applicable regulatory programs. Any interested party may provide evidence to the Department to demonstrate that an area meets the descriptive criteria .... Upon review and verification of such evidence the Department may provide concurrence that the ... classification applies to the area of interest.”

# Ground Water Classification Area Designations, Boundaries and Mapping

# Basis for Digitized Mapping Tool

- Rule includes Figures 1 through 5.
  - Static paper maps are not a useful tool.
  - Site specific conditions determine the Ground Water Classification and Designated Uses
- Digitized mapping tool
  - Could be more useful than static paper maps.
  - A tool, combined with site specific evaluations, could help determine the Ground Water Classification and Designated Uses.

# Class I: Special Ecological Significance

- Class I-A
- Class I-PL (Pinelands Preservation Area)
- Class I-PL (Pinelands Protection Area)

# Class I-A: FW-1 Watersheds and Natural Areas

- Narrative description exists in current rule:

N.J.A.C. 7:9C-1.5(d)iii(1-2)

“(1) Watersheds of FW1 surface waters

(2) The Natural Areas as designated by the Department pursuant to N.J.A.C. 7:5A-1.13.”

- Rule does not reference any figures.
- No GIS layer currently exists for “watersheds of FW1 surface waters.”
- No GIS layer currently exists for Natural Areas.

# Class I-PL Pinelands

- Narrative description exists in current rule.
- Remove reference to Figure 1.
- What this change might look like:

N.J.A.C. 7:9C-1.5(d)2

“2. Class I-PL--Pinelands: The classification area for Class I-PL consists of all ground water in the Cohansey and Kirkwood Formations located within the Pinelands area as designated by the Pinelands Protection Act, N.J.S.A. 13:18A-1 et seq. ~~(as indicated in figure 1 in the Appendix, incorporated herein by reference)~~, other than those ground water areas classified as Class I-A.”

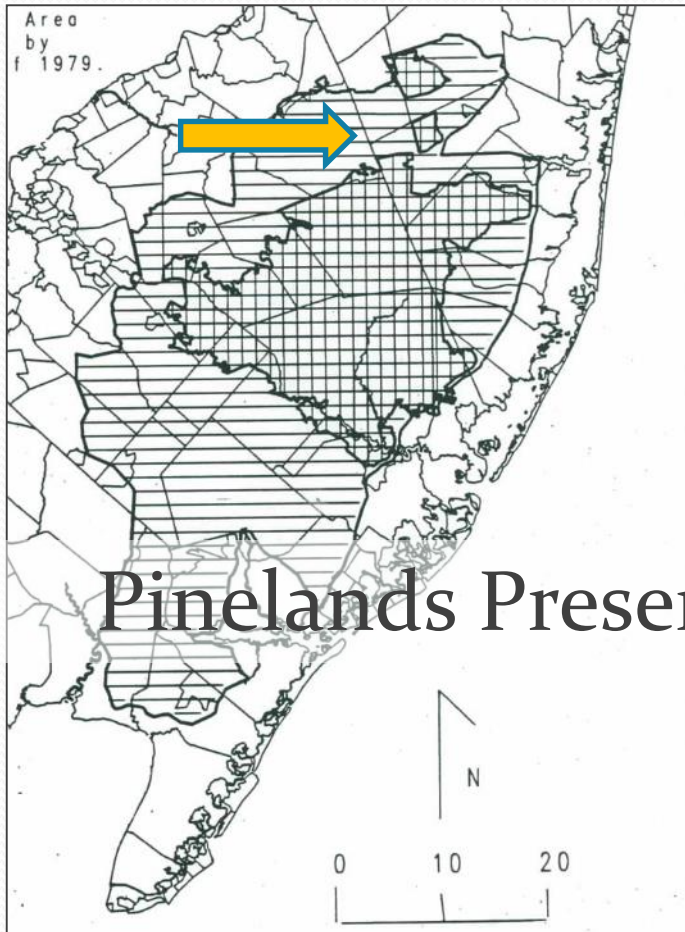
# Class I-PL (Preservation Area):

- “The primary designated use is the support and preservation of unique and significant ecological resources of the Pinelands, through the restoration, maintenance and preservation of ground water quality in its natural state.”
- Criteria = Natural quality = Nondegradation classification in which natural quality shall be maintained or restored. “The Department shall not approve any discharge or any other activity which would result in the degradation of natural quality within a Class I-PL (Preservation Area) classification area.”

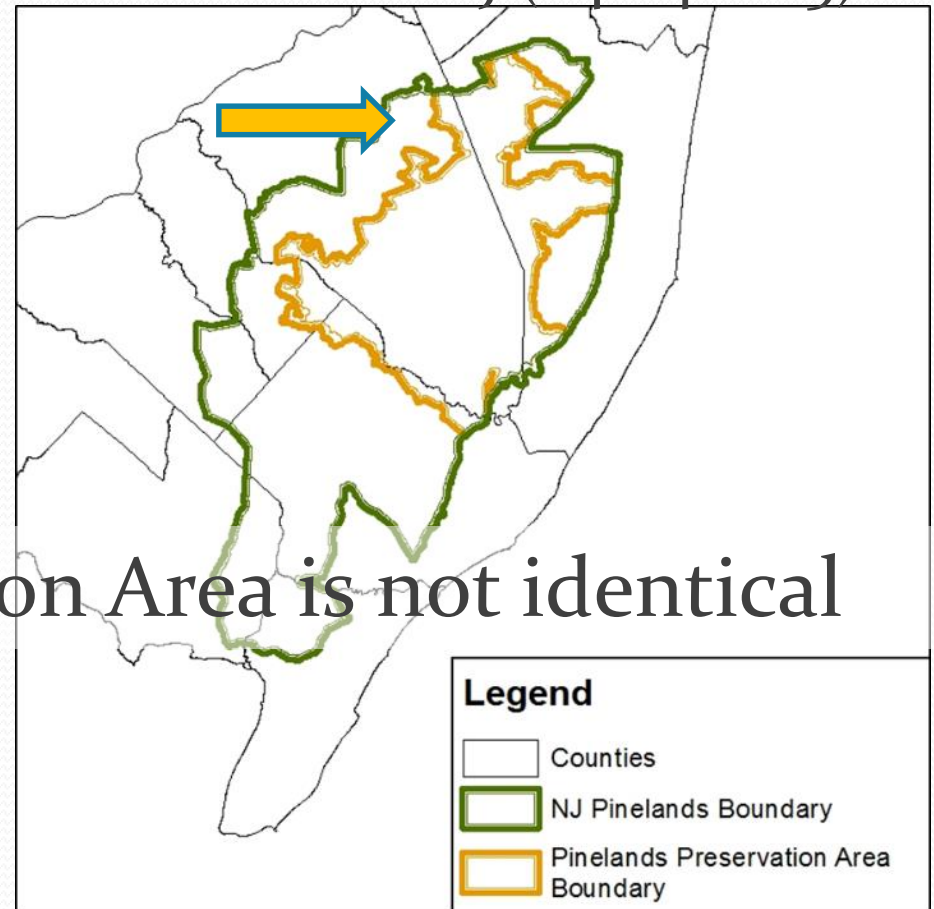


# Class I-PL Pinelands (continued)

Existing rule: Figure 1



Existing GIS layer: Pinelands Boundaries of NJ (04-24-2015)



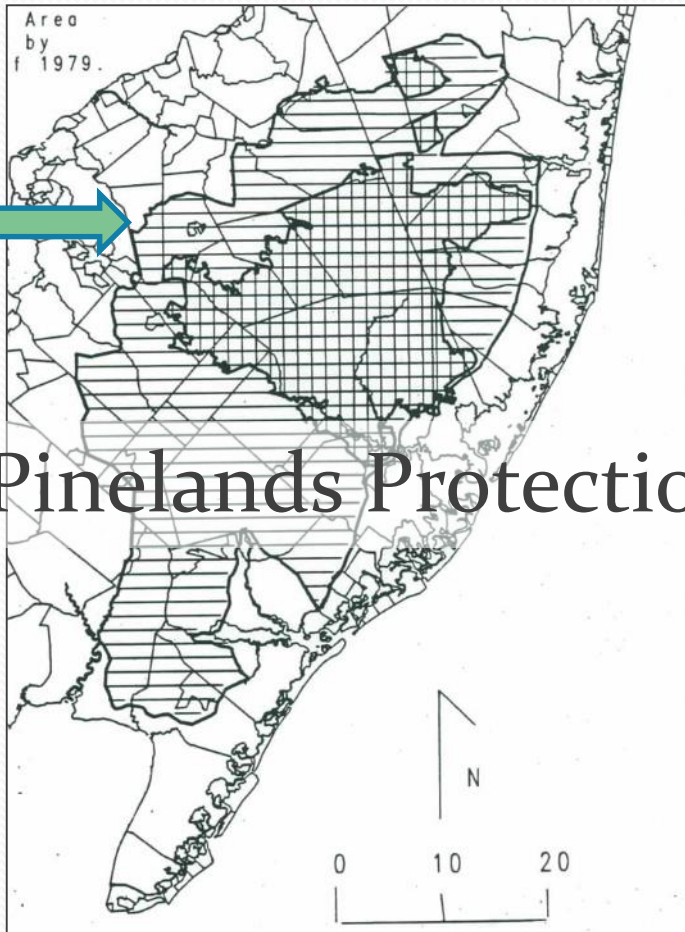
Pinelands Preservation Area is not identical

# Class I-PL (Protection Area)

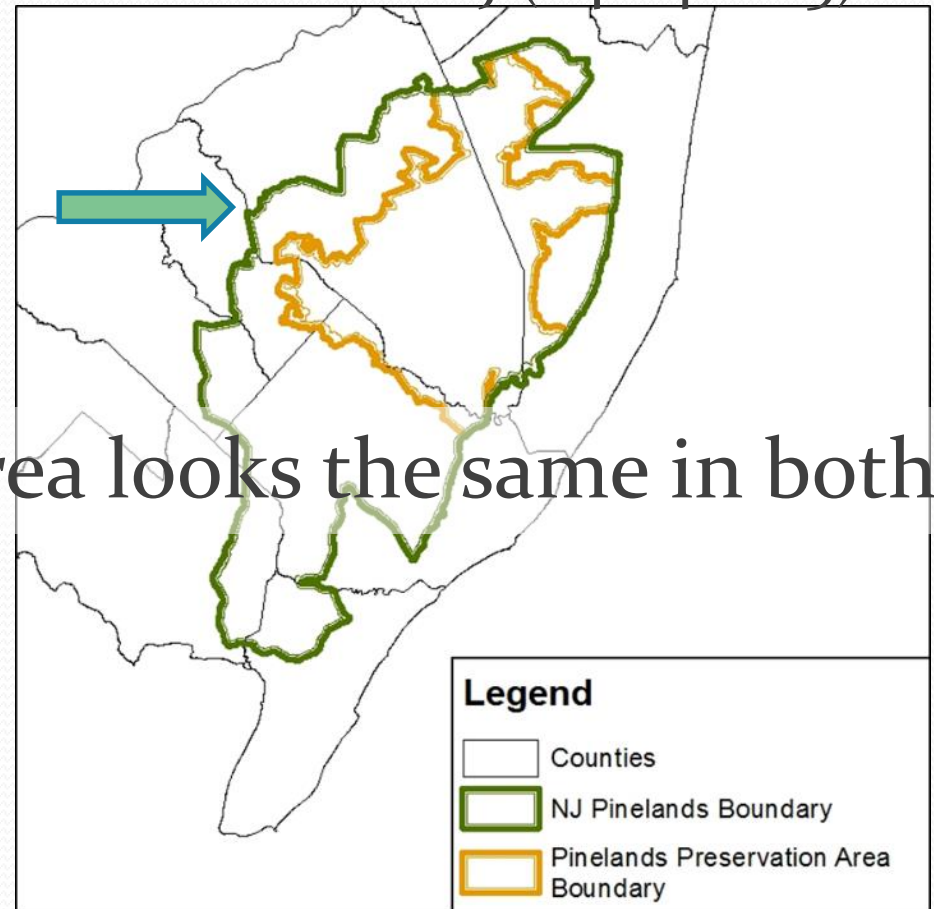
- “The primary designated use is the preservation of Pinelands plant and animal species and their habitats through the protection and maintenance of the essential characteristics of Pinelands ground water quality.”
- Criteria: background water quality. “The Department shall not approve any discharge or any other activity which would result in the degradation of background water quality in the Class I-PL (Protection Area) classification area.”

# Class I-PL Pinelands (continued)

Existing rule: Figure 1



Existing GIS layer: Pinelands Boundaries of NJ (04-24-2015)



Pinelands Protection Area looks the same in both

# Class II Potable Water

- Class II-A
- Class II-B

N.J.A.C. 7:9C-1.5(e): “The primary designated use for Class II ground waters is the provision of potable ground waters with conventional water supply treatment, either at their current water quality (**Class II-A**) or subsequent to enhancement or restoration of regional water quality so that the water will be of potable quality with conventional water supply treatment (**Class II-B**). Both existing and potential potable water uses are included in the designated use.”

# Class II Potable Water Supply

- Class II-A: Default classification: “...all ground water of the State, except for ground water designated in Classes I, II-B or III.”
- Primary designated use: Existing and potential provision of potable ground water with conventional water supply treatment at current water quality.
- Criteria: Human health-based criteria derived based on assessment of risk via consumption pathway (Appendix Table 1).
- Constituent standard = higher of criterion and PQL.



# Class II Potable Water Supply

- Class II-B: “Established through rule or through reclassification pursuant to N.J.A.C. 7:9C-1.10. “The designated uses of Class II-B areas generally may include any reasonable use (other than potable use).”
- Primary designated use: “...provision of potable ground waters ...subsequent to enhancement or restoration of regional water quality so that the water will be of potable quality with conventional water supply treatment....”
- Criteria: Same as Class II-A

# Class II Potable Water Supply

- Class II-A not mapped. Narrative description: “Areas not otherwise designated in Classes I, II-B or III.” (Default classification).
- Class II-B not mapped. Must be established by rule through the reclassification procedure. None to date.



# Class III: Uses Other Than Potable Water Supply

- “Not suitable for potable water due to natural hydrogeologic characteristics or natural water quality. Class III includes geologic formations or units that are aquitards or have a natural quality that is unsuitable for conversion to potable water (for example, saline ground water).”
- Class III-A
- Class III-B

# Class III-A Non-potable uses:

## Aquitards

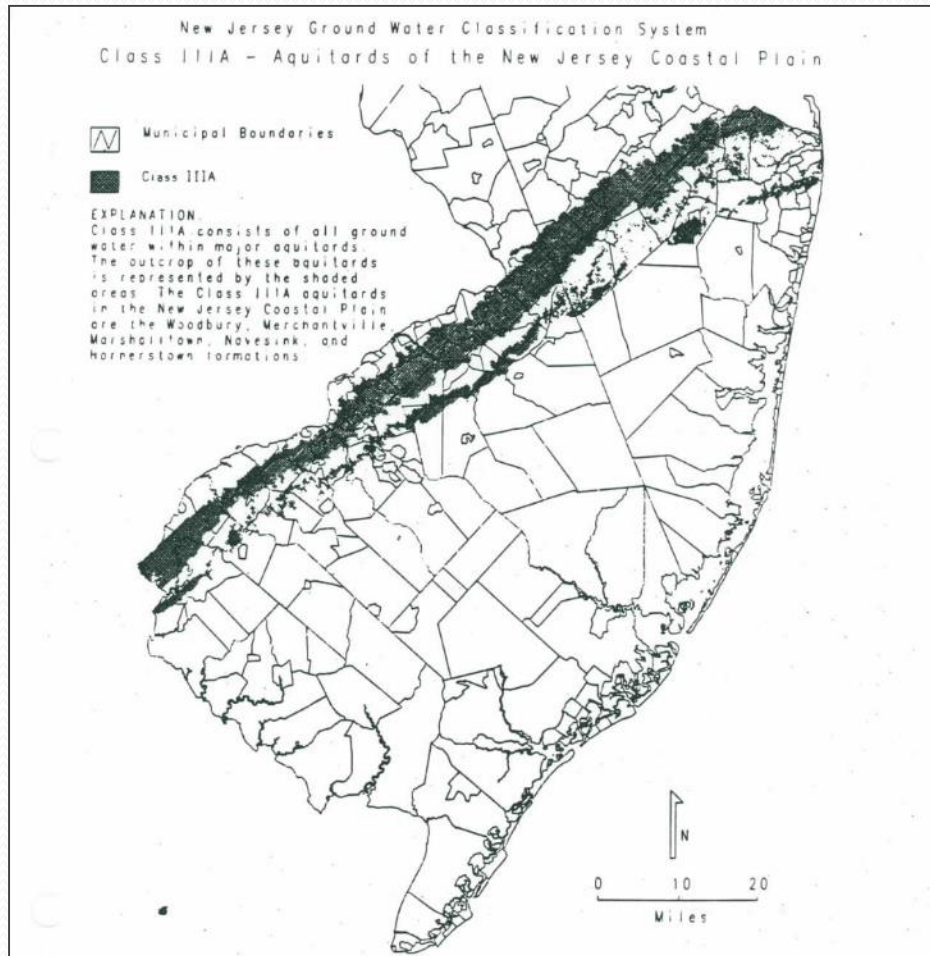
- Primary designated use: “release or transmittal of ground water to adjacent classification areas and surface water, as relevant.”
- Criteria: of the most stringent classification for vertically or horizontally adjacent ground waters that are not Class III-A, unless the Department concludes (in the context of an applicable regulatory program) that there is no significant potential for the migration of ground water pollutants to that classification area

# Class III-A Non-potable uses: Aquitards

- Narrative description of Class III-A based on aquitards.
  - Remove reference to glacial moraine and glacial lake?
- Remove Figure 2
- Use GIS layers as tools

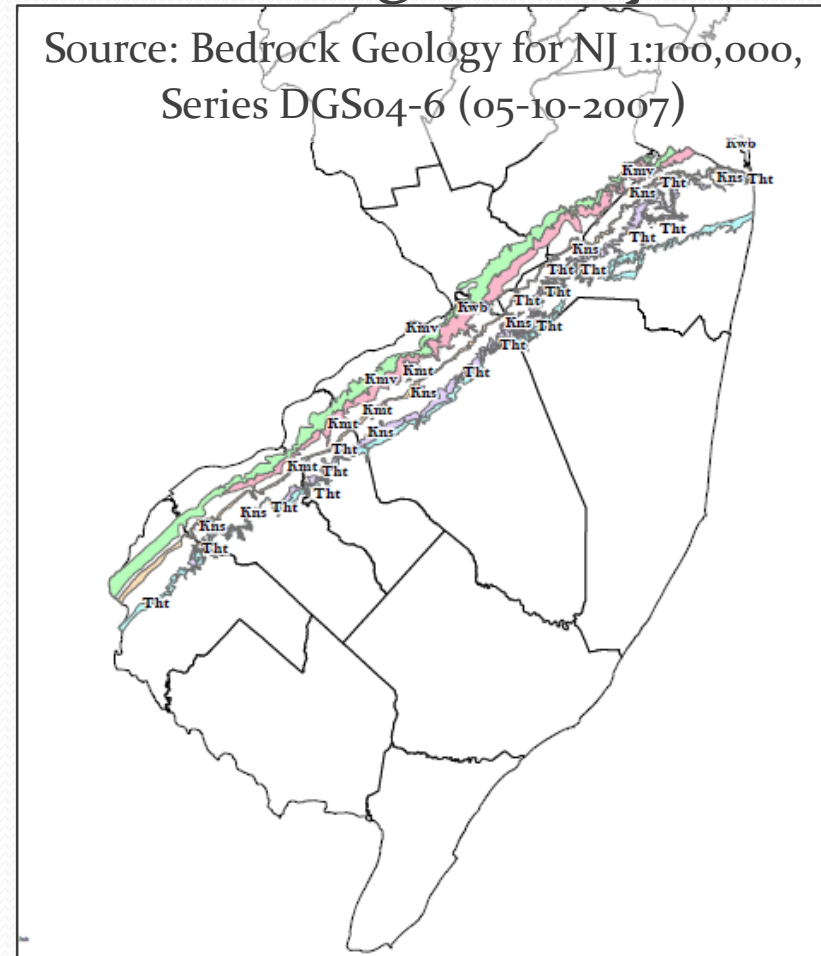
# Class III-A Non-potable uses: Aquitards (continued)

## Existing Figure 2



## Existing GIS layer

Source: Bedrock Geology for NJ 1:100,000, Series DGS04-6 (05-10-2007)



## Class III-A Non-potable uses: Aquitards (continued)

- What these changes might look like:

N.J.A.C. 7:9C-1.5(f)<sub>1</sub>

“1. Class III-A ground water consists of ground water in those aquitards that are described below. **The primary designated use for Class III-A ground water is the release or transmittal of ground water to adjacent classification areas and surface water, as relevant.** Secondary designated uses in Class III-A include any reasonable uses. Class III-A ground water includes portions of the saturated zones (that meet the criteria below) of the Woodbury Formation, Merchantville Formation, Marshalltown Formation, Navesink Formation, Hornerstown Formation, aquitard formations of the Potomac-Raritan-Magothy aquifer system and the Kirkwood aquifer system, ~~portions of the glacial moraine and glacial lake deposits~~, and other geologic units having the characteristics of an aquitard, excepting Class I areas. ~~These named aquitards (excluding glacial units) outcrop approximately in municipalities depicted in Figure 2 in the Appendix.~~ Class III-A areas shall have the following characteristics:”

# Class III-B Non-potable uses, saltwater intrusion or other

- Narrative description subject to field verification: “all geologic formations or units which contain ground water having natural concentrations or regional concentrations (through the action of salt-water intrusion) exceeding 3,000 mg/l Chloride or 5,000 mg/l Total Dissolved Solids, or where the natural quality of ground water is otherwise not suitable for conversion to potable uses.”



# Class III-B Non-potable uses, saltwater intrusion or other

- Primary designated use: “Any reasonable uses for such ground water other than potable water, using water of existing quality.
- Criteria: Narrative. Determined on an area by area basis. Cannot cause impairment of existing ground water use or adversely impact other ground or surface waters.



# Existing Figures 3 through 5:

FIGURE 3

NEW JERSEY GROUND WATER CLASSIFICATION SYSTEM

## CLASS III B

CRETACEOUS POTOMAC-RARITAN-MAGOTHY FORMATION

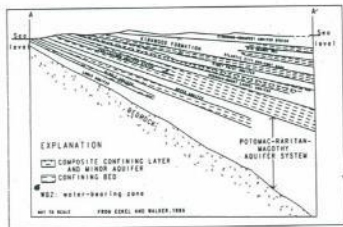
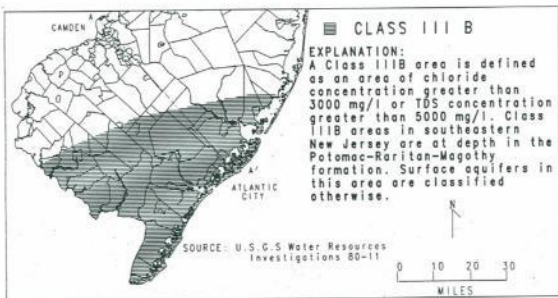
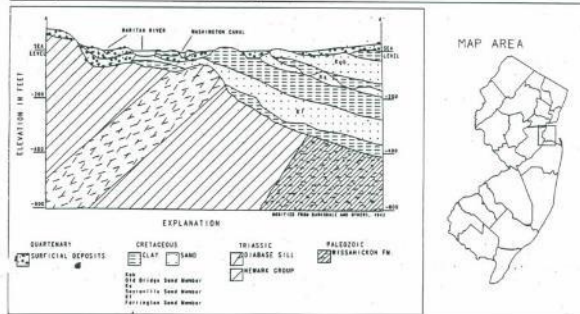
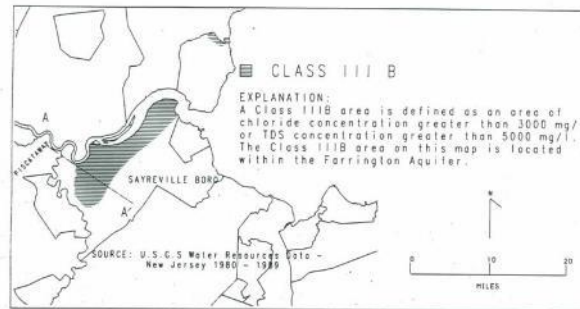


FIGURE 4

NEW JERSEY GROUND WATER CLASSIFICATION SYSTEM

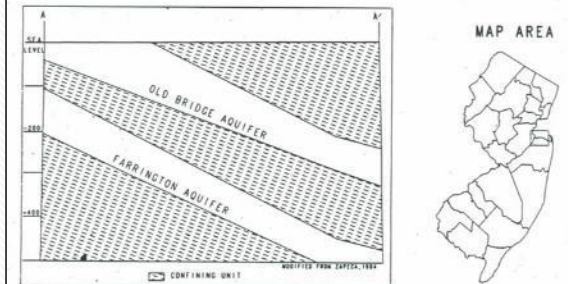
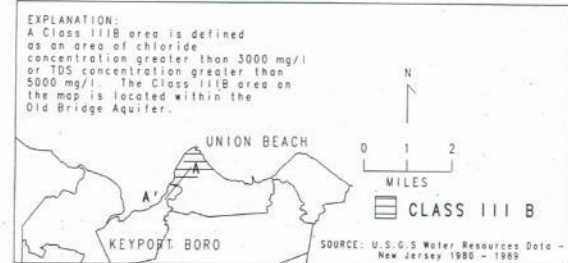
## CLASS III B

### FARRINGTON AQUIFER



NEW JERSEY GROUND WATER CLASSIFICATION SYSTEM

## FIGURE 5 CLASS III B OLD BRIDGE AQUIFER



# Class III-B Non-potable uses, saltwater intrusion or other

- Remove Figures 3-5
- No digitized map of salt-water intrusion exists.
- Confirmation with site specific field data.

- What these changes might look like

N.J.A.C. 7:9C-1.5(f)3

“3. Class III-B ground water consists of all geologic formations or units which contain ground water having natural concentrations or regional concentrations (through the action of **salt-water intrusion**) exceeding 3,000 mg/l Chloride or 5,000 mg/l Total Dissolved Solids, or where the natural quality of ground water is **otherwise not suitable for conversion to potable uses**. The designated uses for Class III-B ground water consist of any reasonable uses for such ground water other than potable water, using water of existing quality. ~~The classification area includes ground water in parts of formations as indicated in Figures 3 through 5 in the Appendix.~~”

continued

N.J.A.C. 7:9C-1.5(f)4

“4. Class III-B areas are **subject to field verification wherever necessary.** ~~Areas not indicated on the maps may also qualify as Class III-B, subject to Department concurrence through an applicable regulatory program.~~

The precise borders of Class III-B areas shall be **confirmed using site specific data** in the context of applicable regulatory programs. Any interested party may provide evidence to the Department to demonstrate that an area meets the descriptive criteria of Class III-B. Upon review and verification of such evidence the Department may provide concurrence that the Class III-B classification applies to the area of interest.”

- Modify and/or move this language so it refers to all ground water classification areas?

# GIS Layers that inform Classification System Mapping

- Class I-A: Watersheds of FW-1 waters
  - GIS layer exists for FW1 waters (*Surface Water Quality Standards of New Jersey, Edition 201012 (Hydr\_water\_stream\_swqs)*)
  - GIS layer does not exist for areas affecting FW1
- Class I-A: Natural Areas
  - GIS layer exists but is not internally or externally published.
- Class I-PL: Pinelands boundary
  - GIS layer exists (*Pinelands Boundary of New Jersey, Edition 20150101 (Envr\_admin\_pinelands\_bnd)*)

# GIS Layers, continued

- Class II-A: Potable
  - No mapping exists; areas not otherwise designated.
- Class II-B: Potable
  - None have been designated.
- Class III-A: Aquitards
  - Bedrock geology layer exists (*Bedrock Geology for New Jersey 1:100,000, Series DGSo4-6, Edition 20070510 (Geol\_bedrock\_geology)*)
- Class III-B: Salt water intrusion
  - GIS layer does not exist



## Overview, with CEAs (GIS):

## Groundwater Classification Area Overview Map with Approved Classification Exception Areas





# Using digitized maps as tools

- Create publicly available GIS data later (coverage) using digitized map of Ground Water Classification System and relevant data layers.
- Update GIS coverage whenever any underlying data layer is revised?
- Create GeoWeb application?
- Other?

# Discussion

# **III. Wrap up and Next Steps**